Analysis of Learning Results of Volleyball Bottom Passing Using the Problem Based Learning Mode

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ABSTRACT

Background: Through the learning process, education creates changes in behavior and cognitive, affective and psychomotor aspects. Physical education is a mandatory subject for students at school. One of the materials that must be taught at school is big ball games such as volleyball with the technique taught, namely the down passing technique. The learning model used by physical education subjects is Problem Based Learning (PBL). PBL is a learning approach that places students as active problem solvers.

Objectives: The aim of this research is to analyze the improvement in learning outcomes of down passing techniques in volleyball.

Methods: The data collection method was carried out using tests and field observations, with instruments in the form of observation sheets, Student Worksheets (LKPD), and data documents.

Results: The research results showed that there was an increase in the percentage of students who achieved learning mastery. It is known that in the pre-cycle, 64% of students were categorized as poor, 27% adequate, 9% good, and 0% very good. In the first cycle there was an increase in students in the poor categories of 30%, fair 9%, good 39%, and very good 21%. In the second cycle, students reached the categories of 0% poor, 6% adequate, 36% good, and 58% very good.

Conclusion: Based on these findings, it was concluded that the application of the PBL learning model was proven to be effective in improving learning outcomes for volleyball underpassing techniques in each cycle.

Keywords: learning outcomes; problem-based learning; bottom passing, volleyball

INTRODUCTION

Education is an effort to provide guidance in the life of children so that they can achieve the highest level of safety and happiness (Marquez & Main, 2021). Education is a planned process that provides knowledge, skills and values to the younger generation (Al Asadullah & Nurhalin, 2021). The goal is to support mental, physical, emotional and social growth so that individuals can contribute effectively to society. Through the learning process, education creates changes in behavior and cognitive, affective and psychomotor aspects (Gunawan et al., 2023). Educational success is influenced by factors such as educators, goals, resources and learning methods (Sanusi et al., 2022). Therefore, education is not only about gaining knowledge but also shaping the mindset and character of students (Ningsih et al., 2021). The learning process is an interaction between teachers and students which aims to convey certain insights, skills, attitudes and values. Students are also required to take various subjects, including Physical Education, Sports and Health (PJOK) which includes material such as volleyball which is a big ball game.

Volleyball is a group sport played on a court surface with a net dividing both sides (Chacoma & Billoni, 2022). Both teams try to send the ball into the opponent's area by hitting it with their hands or arms. Volleyball is a team sport that requires players to work together and support each other, which is very important to form a solid and tough team (Chacoma & Billoni, 2022). Therefore, individual mastery of basic volleyball techniques is a key factor for each player to be able to make the best contribution to the team (Chacoma & Billoni, 2022).

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In this context, mastery of basic volleyball techniques is a key factor that determines achievement in volleyball (Drikos et al., 2021). Given the long duration of the game, the human body relies heavily on carbohydrates as the main energy source during the game (Drikos et al., 2021). The aim of the game is to score points by sending the ball into the opponent's area without returning to one's own side or forcing the opponent to make a mistake.

Bottom passing in volleyball is a basic technique for controlling balls that come low, especially those below the waist. The player raises both arms forward with a low body posture for stability (Chacoma & Billoni, 2022). As the ball approaches, the arms are bent at the elbows with the palms forming a bowl shape to catch the ball. Once the ball touches the forearm, the player moves the arm to direct the ball to the setter or teammate who is ready to attack. To teach basic passing techniques in volleyball effectively, the right strategy and the right methods are needed. This research applies the Problem Based Learning (PBL) learning model to develop students' abilities in mastering basic down passing techniques.

PBL is a learning approach that focuses on solving real and relevant problems in the learning context (Smith et al., 2022). PBL encourages students to actively participate in solving problems, collaborating, and developing the ability to learn independently. PBL utilizes problems that occur in the real world as a basis for encouraging students' critical thinking and problem-solving capabilities in understanding lesson concepts. Success in learning with an appropriate approach is crucial to increasing engagement and PBL can increase students' self-confidence in facing problems. This method focuses on developing critical thinking skills and the ability to solve problems.

Observing PJOK learning in class Their learning results were not satisfactory after two weeks of meetings, with many errors in the position of their feet and hands when receiving the ball. Student involvement in learning is low, their understanding is minimal, and skills are very lacking. This can be seen from the low achievement of learning outcomes, where only a few achieve the target in volleyball underpassing material. Based on the problems found in students, the author plans to help PJOK teachers overcome these problems by providing suggestions regarding learning models, namely through the application of the PBL model, this model can encourage increased student learning outcomes, encourage active involvement during the learning process, as well as encourage students to think critically and become more independent in their skills. The PBL model is effective in building students' understanding of concepts and ways of thinking (Uliyandari et al., 2021).

In detail, the objectives of implementing the PBL model include: (a) helping students hone their critical thinking skills and ability to solve problems; (b) provide opportunities for students to understand the various roles of adults through their involvement in real experiences; and (c) forming students into more independent individuals in their learning journey (Pangaribuan, 2022). There are 5 PBL models, namely: (a) introducing students to the problem to be studied, (b) organizing students in groups for the learning process, (c) providing guidance during investigations, both individually and in groups, (d) developing and presenting findings, and (e) analyzing and assessing the problem solving process that has been carried out (Wulandari, 2021). This is based on existing problems; further research is needed to evaluate the extent to which the application of the PBL learning model can encourage the achievement of learning outcomes.

METHODS

Study Design and Participants

This research applies descriptive methods with a Classroom Action Research (PTK) approach. PTK is a type of research carried out by teachers or researchers in the classroom to observe and evaluate the impact of certain actions on research subjects, with the aim of improving the learning process. PTK focuses on actions that have a direct impact on teachers, with the aim of improving and improving their performance. This research was conducted on 33 students of class XI Culinary 1 of SMK Negeri 6 Surabaya. The data collection techniques used involved tests and field observations.

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Research Instruments

The procedure in this research includes four stages, namely planning, action, observation and reflection. Techniques for identifying trend patterns during the learning process. Data was collected through direct observation using observation sheets and tests carried out by researchers and collaborators, in order to assess the extent to which learning success has increased. The data collection step is to do *pre-test*, application of active learning methods, *post-test*, and observation (student involvement, interaction between students, and level of activeness during learning).

Data Analysis

To analyze data related to improving the achievement of the lower passing technique, descriptive statistical techniques were used, which were based on the results of observations and implementation of cycles in Classroom Action Research (PTK). Data was analyzed using Stata software to see student learning outcomes.

RESULTS

To find out the results of research regarding improvement. This evaluation aims to measure the extent of students' initial abilities in mastering the volleyball underpassing technique, which reflects the learning outcomes of this technique, which is reflected in the percentage increase in the score obtained.

Pra Siklus

Pre-cycle is a test that is performed before the implementation of a given action. This test serves to collect initial data for the researcher, which allows the aim of this evaluation to assess the student's initial level of ability in mastering the volleyball underpassing technique, which reflects the student's learning outcomes on this technique before the researcher takes action on students in class XI Culinary 1 at SMK Negeri 6 Surabaya. Initial results related to student learning in the learning plan can be seen in the following table:

Tabel 1. Pre-Cycle Learning Data ← **10 pt**

Score	Category	Frequency	Percentage
91-100	Very Good	0	0%
81-90	Good	3	9%
70-80	Enough	9	27%
<70	Less	21	64%
Total		33	100%

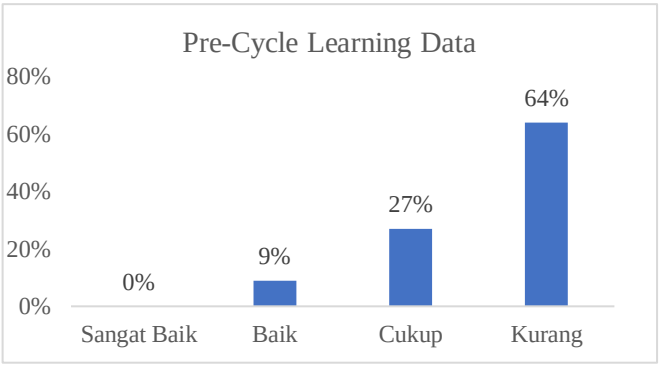

Figure 1. Pre-Cycle Data Distribution ← **10 pt**

Based on the pre-cycle data above before action is taken, it can be seen that in order to master the bottom passing technique in volleyball, there are still many students who have not fully mastered the technique. Based

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on the graph above, it can be seen that only 36% or 12 students can be categorized as good and sufficient in mastering volleyball underpassing techniques, while there are 64% or 21 students who are categorized as poor. This value is obtained from the students' psychomotor scores.

Cycle I

Based on the data on the initial condition of the volleyball underhand passing value of class XI Kuliner 1 students at SMK Negeri 6 Surabaya, it is clear that there is a need to increase the percentage of the value. By implementing a more effective learning method, one approach that can be used is PBL which aims to increase student interest and facilitate their understanding of the material. The achievement of learning outcomes in cycle II can be seen in Table 2. Cycle I Learning Data

Table 2. Learning Data for Cycle II ← **10 pt**

Score	Category	Frequency	Percentage
91-100	Very Good	7	21%
81-90	Good	13	39%
70 – 80	Enough	3	9%
<70	Less	10	30%
Total		33	100%

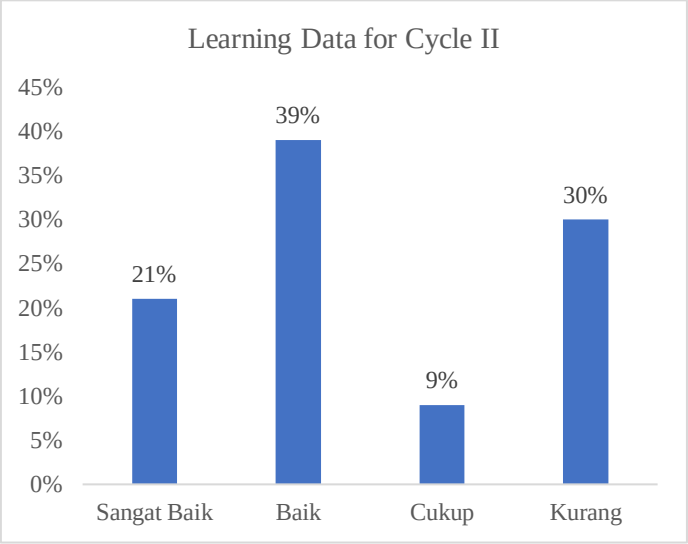

Figure 2. Cycle I Data Distribution ← **10 pt**

Based on the results of direct observations and assessments of the practice of passing under volleyball in cycle I, there is an increase that can be seen in table 2. In this table, you can see an increase in information from observations from pre-cycle to cycle I, with the percentage of students increasing from 36% to 64%. As for the details, 7 students are in the very good category, 13 students are in the good category, 3 students are in the fair category, and 10 students are still in the poor category. Based on the results of reflection or results of observation reviews and student learning outcomes, then continue with the cycle.

Cycle II

Based on the results of the evaluation that has been carried out, it can be seen that there has been a significant increase in student scores, from initially 36% Enhanced to 64% in cycle I, and continuing to rise until reaching 100% in cycle II. The following is information regarding the achievement of student learning outcomes in volleyball underpassing material.

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Table 2. Learning Data for Cycle II

Score	Category	Frequency	Percentage
91-100	Very Good	19	58%
81-90	Good	12	36%
70 – 80	Enough	2	6%
<70	Less	0	0
Total		30	100%

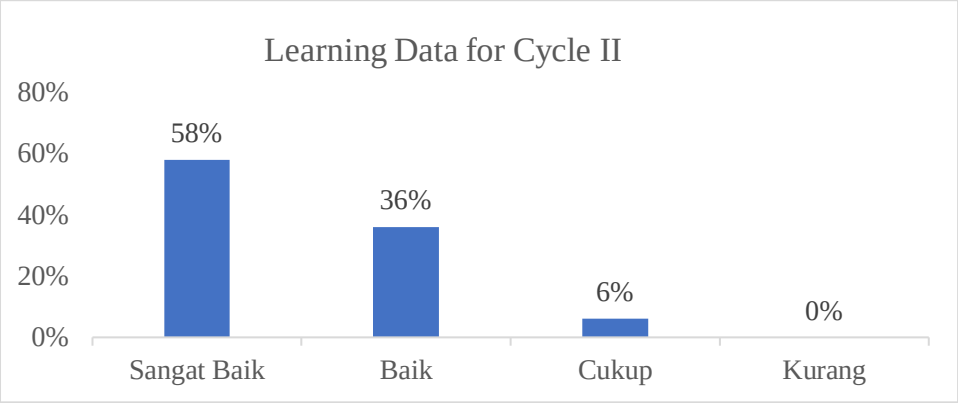

Figure 2. Cycle II Data Distribution ← **10 pt**

Through the results of observations in this cycle, it shows Very Good 58%, Good 36%, Adequate 6% and less than 0%, then the implementation of the PBL learning model implemented by researchers and teachers succeeded in managing classroom conditions well, so that the teaching and learning process could take place optimally. Mastery of the material taught by researchers was also achieved effectively in cycle II. This can be seen from the assessment results obtained in cycle II in table 3. Thus, classroom action research using the PBL model has succeeded in meeting the targets expected in the learning plan.

DISCUSSION

This research is classroom action research which aims to improve the learning outcomes of volleyball underpassing techniques in class XI Culinary 1 students at SMK Negeri 6 Surabaya. This research is very crucial to carry out in order to improve student learning outcomes, especially in mastering basic volleyball passing techniques. In reality, many students still have difficulty applying this basic technique correctly. To overcome this problem, the PBL learning model is applied as a solution. PBL is a powerful method for encouraging students to think critically and actively solve problems. The application of this model aims to increase student participation and help them understand concepts through direct experience. This research is relevant because a learning approach that places students at the center of learning is proven to be able to improve learning outcomes significantly.

Previous studies have indicated that the application of PBL can improve learning outcomes in various fields. For example, previous research shows that applying the PBL model in the sports learning process can improve students' motor skills (Santoso & Santoso, 2024). Apart from that, other research also reveals that this model is able to motivate students to be more actively involved in participating, increase technical understanding, and strengthen practical skills in various sports and is effective in training students' critical thinking skills (Syamsuar & Zen, 2021).

Based on previous research, the application of PBL in learning volleyball underpassing is expected to have a positive impact on students' mastery of technique. In this research, it is proven that the application of the PBL model has a significant impact in improving student learning outcomes, which can be seen from the increase in the percentage of learning completion, starting from pre-cycle to cycle II. (36%) to cycle I (64%) in cycle II,

the percentage of completion reached 100%. The implications of this research indicate that the PBL model could be an effective alternative learning method for improving technical skills in sports, especially volleyball. This approach has proven successful in increasing student involvement and motivation in learning sports, which is often considered less interesting. Apart from that, the application of PBL teaches students to not only master techniques, but also develop capabilities in solving problems, collaboration, and critical thinking capabilities which play a very crucial role in everyday life (Hidayah et al., 2021).

A recommendation for further research is to explore the application of PBL to other techniques in sports, for example overhead passing or serving in volleyball, to see whether this model can also improve skills in other aspects. In addition, further research can be carried out to compare the effectiveness of PBL with other learning methods in the sports context, as well as to find out whether there are other factors such as student motivation or teacher characteristics that influence the successful implementation of this model. Further research could also involve a larger number of participants or be conducted at different educational levels to find out whether similar results can be achieved.

CONCLUSION

The application of the Problem Based Learning (PBL) learning model in learning volleyball bottom passing has proven to be effective in improving student learning outcomes. Through a learning process that is more interactive and based on problem solving, students become more active in understanding and mastering the techniques taught. The significant increase in mastery of the down passing technique shows that this method not only improves students' theoretical understanding but also their practical skills. The implications of this research show that a problem-based learning approach can be used as an effective strategy in physical education learning, especially in sports skills. Therefore, it is recommended that teachers continue to explore innovative methods that can increase student engagement and learning effectiveness, as well as conduct further research to test the effectiveness of PBL on other sports skills.

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Conflict Of Interest

If the research does not have a conflict of interest with any party, the author can fill in the sentence, "The author hereby declares that this research is free from conflicts of interest with any party".

Author's Contribution

The author's contribution is the author's role in research activities. The author's contributions include preparing concepts, formulating methods, conducting research, processing results, interpretations, and conclusions, editing the final version. One author can contribute more than one thing. For example:

Hanief (first author's last name) contributed in preparing concepts, formulating methods, and conducting research. Pratama (second author's last name) contributed in processing the results, interpreting and drawing conclusions. Widiawati (last name of the third author) contributed.

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